Claims

1. An apparatus for stripping dirt off belts in conveyor belt assemblies in the area of a drive and/or head pulley of the belt
   - comprising a system carrier to be attached to a belt carrier frame,
   - at which at least one stripping element is arranged,
   - the stripping element having a stripping lamella mounted on a lamella holder,
   - the stripping lamella contacting the belt in a peeling position,
   - and wherein the stripping element has a bottom swivel mount coupled to the lamella holder and having a horizontal swivel axis – indications such as "horizontal" or the like here and in the following principally refer to the position of use of the stripping element –
   - as well as a spring means acting to press the stripping lamella on the lamella holder against the belt in such a form and arrangement
   - that the lamella holder in the stripping position of the stripping lamella is swivelled about the horizontal swivel axis in a spring loaded fashion,
   - and when obstructions fast adhering to the belt impact on the stripping lamella, the lamella holder may be easily deflected and returned back to the working position on the belt,

   characterized in that
   - the stripping lamella (8) is swivel mounted at the lamella holder (7) by a top swivel mount (12) having a horizontal swivel axis (14) and
   - is held by a top spring means in a spring biased fashion whose spring action – with respect to the bottom swivel mount (11) and its spring means – is in the counter sense.

2. The apparatus according to claim 1, characterized in that the spring means acting on the lamella holder (7) via the bottom swivel mount (11) and/or acting on the stripping lamella (8) via the top swivel mount (12) is a torsion spring.

3. The apparatus according to claim 1 or 2, characterized in that the top and/or bottom swivel mount (12, 11) is configured to be a torsion spring bearing (15, 16), in particular, a rubber torsion spring bearing.

4. The apparatus according to claim 2 or 3, characterized in that the torsion spring bearing (15, 16) is formed of an internal square rod (25) and a correspondingly inside square housing (22, 23, 24) having spring elements (29) of rubber or the like in the corner areas formed by the internal square rod (25) and the housing (22, 23, 24), for enlarging the maximum deflection angle consisting of at least two individual torsion springs coupled in series in a spring effective way, so that the overall resulting deflection angle of the torsion spring bearing (15, 16) corresponds to the sum of the deflection angles of the individual torsion springs.

5. The apparatus according to claim 4, characterized in that of three individual torsion springs formed side by side on a continuous internal square rod (25) having separate housings (22, 23, 24) and spring elements (29), a double spring, i.e. a torsion spring having a double deflection angle, is created, wherein the two lateral housings (22, 23) are coupled in a torsion resistant manner and form one end of the double spring while the middle housing (24) is the other end of the double spring.

6. The apparatus according to claim 5, characterized in that one arm of the lamella holder (7) via which a connection is made between the bottom and the top torsion spring bearing (15, 16) has its top end attached to the middle housing (24) of the top torsion spring bearing (16) configured as a double spring and/or has its bottom end coupled to the middle housing (24) of the bottom torsion spring bearing (15) configured as a double spring, while the two lateral housings (22, 23) are each commonly attached to a lamella plate (31) (top torsion bearing (16)) and to a foot (bottom torsion bearing (15)) of the stripping element (6).

7. The apparatus according to any one of the preceding claims, characterized in that the effective line (W) of the stripping edge (9) of the stripping lamella (8) in the stripping position of the stripping lamella (8) at the belt (1) extends in the bottom 90° sector between the horizontal and the vertical centre planes of the contact angle of the belt (1) on the pulley (2) – in particular, however, in the so-called three o'clock position.

8. The apparatus according to any one of the preceding claims, characterized in that the attack angle of the stripping lamella (8) in its peeling-off stripping position at the belt (1) is in the angle range of between about 40° and about 80° against the tangent to the radius of the angle of contact of the belt (1) at the pulley (2) in the point of the effective line (W) of the stripping edge (9) of the stripping lamella (8), in particular, however, is about 60°.

9. The apparatus according to any one of the preceding claims, characterized in that the axis (13) of the bottom swivel mount (11) on the pulley side of the tangent to the radius of the angle of contact of the belt (1) at the pulley (2) is in the point of the effective line (W) of the stripping edge (9) of the stripping lamella (8), and the axis (14) of the top swivel mount (12) is on the side of the tangent facing away from the pulley (2).

10. The apparatus according to claim 9, characterized in that the axis (13) of the bottom swivel mount (11) is on or close to the tangent.

11. The apparatus according to any one of the preceding claims, characterized in that the distance between the top and the bottom swivel mounts (12, 11) is chosen sufficiently great that the angle for the biasing amount of the spring means associated with the bottom swivel mount (15) and the angle for the deflection path of the lamella holder (7) about the bottom swivel axis (13) with obstructions (H) impacting on the stripping lamella (8) are together in the range of between 40° and 80°, however together preferably about 65°.

12. The apparatus according to any one of the preceding claims, characterized in that the stripping position of the stripping lamella (8) is adjusted having the desired attack angle of the stripping lamella (8) on the lamella holder (7) and having the right bias of the associated spring means and is fixed by means of an adjustable screw (19) or a spacer or the like.

13. The apparatus according to any one of the preceding claims, characterized in that the biasing force of the spring means associated with the bottom swivel mount (15) is adjusted by suitably swivelling the lamella holder (7) about the necessary biasing amount and fixing of the lamella holder (7) in the biased

position, e.g. by means of a particularly adjustable screw (17) or by means of a spacer.

14. The apparatus according to any one of the preceding claims, characterized in that the setting of the stripping lamellae (8) in the stripping position at the belt (1) is carried out by accordingly swivelling the lamella holder (7) of the stripping elements (6) about the bottom swivel mount (15) accompanied by biasing the associated spring means by adjusting the system carrier (4).

15. The apparatus according to claim 14, characterized in that the adjustment and biasing of the lamella holders (7) may be carried out by shifting the system carrier (4).

16. The apparatus according to claim 15, characterized in that a shifting of the system carrier (4) in a horizontal direction in the case of an effective line (W) of the stripping lamella (8) is in particular in the three o'clock position.

17. The apparatus according to any one of claims 14-16, characterized in that the system carrier (4) is carried at both ends directly in horizontally shifting bearings.

18. The apparatus according to any one of claims 14-16, characterized in that the system carrier is attached to rigid supports (33) at both ends, each supported by bearings arranged centrally in the area or in the height of the horizontal axis of the pulley (2) and in horizontally shifting bearings on both ends of the system carrier (4) and supported in horizontally shifting bearings (32).

19. The apparatus according to any one of claims 14-16, characterized in that the system carrier (4) is attached to rigid supports (33) at both ends, the supports being horizontally shiftable by means of bearings (32) each being arranged above the horizontal axis of the pulley (2).

20. The apparatus according to claim 14, characterized in that the system carrier (4) is arranged in an area below the effective line (W) of the stripping lamella (8) and the adjustment of the system carrier (4) is done by rotating or

swivelling of the same by having a torque act on the system carrier (4) itself or on its swivelling bearing.

21. The apparatus according to claim 20, characterized in that the torque is generated pneumatically, hydraulically or mechanically by means of tension, pressure or torsion springs or by weight forces or the like.

22. The apparatus according to any one of claims 14 as well as 20-21, characterized in that the torque is generated coaxially between the system carrier (4) and the lateral bearings of the system carrier (4).

23. The apparatus according to any one of claims 14 as well as 20-21, characterized in that the torque is generated in bearings below or above the horizontal centre axis of the pulley (2) and each at a distance to this axis, at both ends of the system carrier (4), and the torque causes, via rigid lateral supports (33) carrying the system carrier (4), a swivel movement of the system carrier (4).